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EXAMINER	
SANTOS, JOSEPH M	

ART UNIT	PAPER NUMBER
4155	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.**	**Applicant(s)**	
	10/599,322	SCHEIRER ET AL.	
	Examiner	**Art Unit**	
	JOSEPH SANTOS	4155	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 September 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/25/2006*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-13 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Finsterwald et al. (4,802,458) in view of Talbot et al. (6,182,341).

3. Regarding Claim 1, Finsterwald et al. disclose a transducer ("46") located in a bath of ultrasonic fluid (Column3, lines 5-6). Finsterwald et al. disclose a transducer crystal ('46") mounted in the probe (Column 2, lines 17- 20. The examiner is interpreting the "probe" disclose by Finsterwald et al. to be "mechanism" in "movable mechanism" in claim1 by the applicant) in which the hand-held transducer probe is easy and convenient to use and manipulate (Column 1, lines 20-24) as well as the bellow "30" to be the movable mechanism. Finsterwald et al. disclose a cone assembly("22") which is moved during the fluid filling of the probe (Column 3, lines 7-10) in which an acoustic window(portion of element "22") is located in the cone and ultrasonic energy pass to and from the transducer (Column 3, lines 24-26). However, Finsterwald et al. fails to disclose a conductive layer lining the acoustic window in which is coupled to a reference potential.

Talbot et al. discloses the adhesion of an acoustic window ("low loss acoustic window", element "56") and a layer ("RFI shield", element "54"), (Column 5, lines 18-21). Talbot et al.

further disclose the RFI shield is couple to a reference potential "ground" by connection to "ground flex circuits" (Column 5, lines 4-8).

It would have been obvious to one ordinary skilled in the art to add the conductive layer ("RFI shield") disclosed by Talbot et al. to the acoustic window located in the ultrasound probe apparatus disclosed by Finsterwald et al. In addition, it would have been obvious to one ordinary skilled in the art to interpret that the RFI shield is couple to the acoustic stack as seen in Figure 2, element "54" "RFI shield" and element "52" "acoustic stack", to a reference potential by the ground flex circuits of the acoustic stack.

The motivation for the modification of the ultrasound probe containing an acoustic window and adding a RFI shield is to reduce electromagnetic interference caused by the hospital or clinical environment which would produce noise in the ultrasound image (Talbot et al, Column 2, lines 11-14).

2. Regarding Claim 2, Finsterwald et al. and Talbot et al. disclose all the elements in Claim 1. However, Finsterwald et al. fails to disclose the conductive layer is located on the inner surface of the acoustic window.

Talbot et al. disclose the acoustic window "low loss polyurethane window" "56" is cast directly on top of an epoxy layer "62", in which this epoxy layer is deposited over the top surface of the RFI shield (Column 5, lines 26-31).

It would have been obvious to one ordinary skill in the art to recognize the acoustic window is located on top of the RFI shield.

The motivation for the modification of the ultrasound probe containing an acoustic window and adding a RFI shield is to reduce electromagnetic interference caused by the hospital

or clinical environment which would produce noise in the ultrasound image (Talbot et al, Column 2, lines 11-14).

3. Regarding Claim 3, Finsterwald et al. and Talbot et al. disclose all the elements in Claim 1. However, Finsterwald et al. fails to disclose the conductive layer is embedded in the acoustic window. Talbot et al. disclose the acoustic window "low loss polyurethane window" is cast directly on top of an epoxy layer, in which this epoxy layer is deposited over the top surface of the RFI shield (Column 5, lines 26-31).

It would have been obvious to one ordinary skill in the art to recognize the RFI shield is embedded in the acoustic window.

The motivation for the modification of the ultrasound probe containing an acoustic window and adding a RFI shield is to reduce electromagnetic interference caused by the hospital or clinical environment which would produce noise in the ultrasound image (Talbot et al, Column 2, lines 11-14).

4. Regarding Claim 4, Finsterwald et al. and Talbot et al. disclose all the elements in Claim 1. However, Finsterwald et al. fails to disclose the acoustic window comprises a dome-shaped cap.

Talbot et al. disclose the shape of the acoustic window in Figure 2, element "56" "low loss acoustic window" Figure 2, element "56".

It would have been obvious to one ordinary skill in the art to recognize the dome-shaped cap shape of the "low loss acoustic window" disclose by Talbot et al. Figure 2, element "56".

The motivation for the modification of the ultrasound probe containing an acoustic window with the dome-shaped low loss acoustic window including an RFI shield disclose by

Talbot et al. would be to reduce electromagnetic interference caused by the hospital or clinical environment which would produce noise in the ultrasound image (Talbot et al, Column 2, lines 11-14).

5. Regarding Claim 5, Finsterwald et al. and Talbot et al. disclose all the elements in Claim 1. However, Finsterwald et al. fails to disclose the acoustic window comprises a relatively flat contact lens-shaped cap.

Talbot et al. disclose the shape of the acoustic window in Figure 2, element “56” “low loss acoustic window”

It would have been obvious to one ordinary skill in the art to recognize the contact lens-shaped cap of the "low loss acoustic window" disclose by Talbot et al. Figure 2, element “56”.

The motivation for the modification of the ultrasound probe containing an acoustic window with the lens-shaped low loss acoustic window including an RFI shield disclose by Talbot et al. would be to reduce electromagnetic interference caused by the hospital or clinical environment which would produce noise in the ultrasound image (Talbot et al, Column 2, lines 11-14).

6. Regarding Claim 6, Finsterwald et al. and Talbot et al. disclose all the elements in Claim 5. In addition, Finsterwald et al. further discloses the transducer probe is provided with a sector scanning capability by oscillating the transducer crystal (Column 2, lines 14-17). Finsterwald et al. further discloses in Figure 2, element “46”, the curved shape of the “imaging transducer”.

It would have been obvious to one ordinary skilled in the art to recognize the oscillation of the transducer when it is scanning a region and this transducer has a curved shape as show in Finsterwald et al. Figure 2, element “46”.

The motivation for the modification of the ultrasound probe containing an acoustic window adding a RFI shield is to reduce electromagnetic interference caused by the hospital or clinical environment which would produce noise in the ultrasound image (Talbot et al. Column 2, lines 11-14).

7. Regarding Claim 7, Finsterwald et al. and Talbot et al. disclose all the elements in Claim 1. However, Finsterwald et al. fails to disclose the conductive layer is made of gold, a titanium/gold alloy or aluminum.

Talbot et al. disclose the metal of the RFI shield may be selected from the group including gold, titanium, chromium or alloys thereof (Column 5, lines 43-45).

It would have been obvious to one ordinary skill in the art to modify the conductive layer to be of gold material.

The motivation for the modification of the ultrasound probe containing an acoustic window adding a RFI shield is to reduce electromagnetic interference caused by the hospital or clinical environment which would produce noise in the ultrasound image (Talbot et al, Column 2, lines 11-14).

8. Regarding Claim 8, Finsterwald et al. and Talbot et al. disclose all the elements in Claim 1. However, Finsterwald et al. fails to disclose wherein the conductive layer is formed on the acoustic window by a vacuum deposition processes such as sputtering, vacuum evaporation, physical vapor deposition, arc vapor deposition, ion plating or laminating.

Talbot et al. disclose the adhesion between the low loss acoustic window and the RFI shield is done by placing an epoxy seed layer on top of the RFI shield and later the acoustic window is cast on top of the RFI shield (Column 5, lines 25-31).

It would have been obvious to one ordinary skill in the art to recognize the lamination process between the RFI shield and the acoustic window using an epoxy layer.

The motivation for the modification of the ultrasound probe containing an acoustic window adding a RFI shield is to reduce electromagnetic interference caused by the hospital or clinical environment which would produce noise in the ultrasound image (Talbot et al, Column 2, lines 11-14).

9. Regarding Claim 9, Finsterwald et al. and Talbot et al. disclose all the elements in Claim 1. However, Finsterwald et al. fail to disclose wherein the conductive layer is coupled to a reference potential by conductive epoxy, solder connection, clapped pressure creating a metal-metal contact, conductive gaskets or O-rings, or discrete drain wires.

Talbot et al. disclose the conductive layer "shield substructure" is on top of the acoustic stack providing a metal-to-metal coupling (Column 2, lines 62-67 and Figure 2, element “54” "RFI shield” and element “52” “acoustic stack”) and within the acoustic stack comprise a reference potential connection by the acoustic stack ground flex circuits (Column 5, lines 4-8).

It would have been obvious to one ordinary skilled in the art to recognize the coupling between the acoustic stack comprising a ground connection with the RFI shield using a metal-to-metal contact.

The motivation for the modification of the ultrasound probe containing an acoustic window adding a RFI shield is to reduce electromagnetic interference caused by the hospital or clinical environment which would produce noise in the ultrasound image (Talbot et al, Column 2, lines 11-14).

10. Regarding Claim 10, Finsterwald et al. and Talbot et al. disclose all the elements in Claim 1. However, Finsterwald et al. fail to disclose the conductive layer comprises a continuous layer of conductive material.

Talbot et al. disclose in Figure 2, element "54" the continuity of the material forming the RFI shield.

It would have been obvious to one ordinary skill in the art to recognize the continuity of the material comprising the RFI shield disclosed by Talbot et al.

The motivation for the modification of the ultrasound probe containing an acoustic window adding a RFI shield is to reduce electromagnetic interference caused by the hospital or clinical environment which would produce noise in the ultrasound image (Talbot et al, Column 2, lines 11-14).

11. Regarding Claim 11, Finsterwald et al. and Talbot et al. disclose all the elements in Claim 1. However, Finsterwald et al. fail to disclose the conductive layer comprises a porous layer of conductive material.

Talbot et al. disclose that a conductive layer which comprise the RFI shield, a shield substructure, a seed layer (Column5, 63-64) and a layer of refractory metal element 68' (Column 6, lines 34-35). Talbot disclose the surface of this conductive layer is not smooth (Column 6, lines 34-35).

It would have been obvious to one ordinary skilled in the art to recognize the porosity of the conductive layer disclose by Talbot et al.

The motivation for the modification of the ultrasound probe containing an acoustic window adding a RFI shield is to reduce electromagnetic interference caused by the hospital or

clinical environment which would produce noise in the ultrasound image (Talbot et al, Column 2, lines 11-14).

12. Regarding Claim 12, Finsterwald et al. and Talbot et al. disclose all the elements in Claim 11. However, Finsterwald et al. fails to disclose within the porous layer comprises a grid-like screen of conductive material.

Talbot et al. disclose that a conductive layer which comprise of the RFI shield plus a shield substructure, a seed layer (Column5, 63-64) and a layer of refractory metal element 68' (Column 6, lines 34-35). Talbot et al. disclose the surface of this conductive layer is not smooth (Column 6, lines 34-35). In addition, Talbot et al. disclose holes, slots or pattern may be formed on the polymeric material on the conductive layer (Column 6, lines 47-49).

The motivation for the modification of the ultrasound probe containing an acoustic window adding a RFI shield is to reduce electromagnetic interference caused by the hospital or clinical environment which would produce noise in the ultrasound image (Talbot et al, Column 2, lines 11-14).

13. Regarding Claim 13, Finsterwald et al. and Talbot et al. disclose all the elements in Claim 1. However, Finsterwald et al. fails to disclose the conductive layer is thin enough to be highly transmissive of ultrasound at a frequency of the transducer.

Talbot et al disclose that the conductive layer "shield substructure" faces an object to be imaged (Column 2, lines 62-65).

It would have been obvious by one ordinary skilled in the art to recognize the "shield substructure' is thin enough to be used in the processed of ultrasound treatment. This conductive

layer is couple below to the acoustic window and the ultrasonic energy will cross both the conductive layer and the acoustic window.

The motivation for the modification of the ultrasound probe containing an acoustic window adding a RFI shield is to reduce electromagnetic interference caused by the hospital or clinical environment which would produce noise in the ultrasound image (Talbot et al, Column 2, lines 11-14).

14. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Finsterwald et al. (4,802,458) in view of Talbot et al. (6,182,341) as applied to claims 1-13 above, and further in view of Smith et al. (5,311,095).

Regarding Claim 14, Finsterwald et al. and Talbot et al. disclose all the elements in Claim 13. However, Finsterwald et al. and Talbot et al. fail to disclose the conductive layer exhibits a thickness of 1/16 of a wavelength or less of the frequency of the transducer.

Smith et al. disclose that a conductive layer "10" could be less that one quarter the wavelength of the frequency of operation (Column4, lines 32-45).

It would have been obvious to one ordinary skilled in the art to adjust the thickness of the conductive layer to be less that 1/16 as disclose by Smith et al.

The motivation for the modification of the ultrasound probe containing an acoustic window and adding a conductive layer in which this layer could be less than the wavelength of the frequency of operation of the transducer would be to utilizes acoustic matching techniques and multi-layer ceramic fabrication technology to provide a two-dimensional array ultrasonic transducer having transducer elements of less than one wavelength on a side an having sufficient sensitivity and width for high resolution medical imaging (Column 3, lines 1-8).

15. Claim 15 rejected under 35 U.S.C. 103(a) as being unpatentable over Finsterwald et al. (4,802,458) in view of Talbot et al. (6,182,341) as applied to claims 1-13 above, and further in view of Sleva et al. (5,488,954).

Regarding Claim 15, Finsterwald et al. and Talbot et al. disclose all the elements in Claim 13. However, Finsterwald et al. and Talbot et al. fail to disclose wherein the conductive layer exhibits a thickness in the range of 1000-3000 Angstroms.

Sleva et al. disclose the fabrication of a conductive 1000 Angstrom aluminum layer (Column 7, lines 52-53).

It would have been obvious at the time the invention was made to utilizes a silver conductive layer of 1000 Angstroms in the ultrasound probe with a acoustic window disclose by Finsterwald et al. which comprise a couple conductive layer disclose by Talbot et al.

The motivation for the modification of the ultrasound probe containing an acoustic window and adding a conductive layer in which this layer thickness is 1000 Angstroms disclose by Sleva et al. would be that ocusing may be provided by the conducting layers by patterning a Fresnel zone pattern (FZP) in one or both of the conducting layers. The use of such an integral, planar focusing means eliminates the need for precise machining required for a spherical lens catheter, and yet sufficiently limits the beam width to avoid interference from off-axis structures that would otherwise interfere with the detection of a layered structure in the focused direction.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSEPH SANTOS whose telephone number is (571)-270-7782. The examiner can normally be reached on Monday thru Thursday 7:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nguyen Thu can be reached on (571)-272-6967. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JS

/Matthew F DeSanto/
Primary Examiner, Art Unit 3763